Glaisher. His prominent career in mathematical science, which began at an early age, has been continued down to the present day without remission, not only in the production of original papers, but in university teaching, and in the careful editorship of most of the special mathematical journals in this country. To these journals he has constantly contributed much of his own work, such as his papers on the theory of numbers, on elliptic functions, and many other departments of pure mathematics.

In considering the bestowal of the medals this year the council has determined to award the Hughes medal to one who has spent his days in the application of scientific discovery to practical life—Alexander Graham Bell. Although he has been resident for many years on the other side of the Atlantic Ocean, we remember that he was born in Edinburgh, and was educated there and in London, so that we claim him as a fellow-countryman. His preponderating share in the invention of the telephone, now so long ago as 1876, and his practical investigations in phonetics, have laid modern civilisation under deep obligation to him, while his numerous other inventions and experiments show the fertility of his genius.

The anniversary dinner of the society was held on Monday evening at the Hôtel Métropole. Sir William Crookes presided and responded to the toast of "The Royal Society," proposed by the American Ambassador. The toast of "The Retiring President" was proposed by Sir Joseph Larmor and acknowledged by Sir Archibald Geikie. Sir Ray Lankester and Prof. Harold Dixon responded to the toast of "The Medallists," Sir David Gill proposed the toast of "The Guests," and Lord Sumner responded to it.

NOTES.

A CORRESPONDENT points out that the list of the new members of the council of the Royal Society published in NATURE of November 13 (p. 324), contains the names of ten fellows of the society who have not served on the council before, out of the total of sixteen ordinary members of the council. In the council elected in 1912, there were only five members who had not served in previous years; and the list for 1911 included eight fellows who had served before and the same number of fellows who had not done so. This year's list contains, therefore, a larger number of completely new members of the council than is usual. Ten members of the new council, and nine of the retiring council, are Cambridge men.

DR. HENRI DESLANDRES, Paris, has been elected an honorary member of the Royal Institution.

A LECTURE on the properties and uses of radium will be delivered at the Cancer Hospital (Free), Fulham Road, London, S.W., by Mr. C. E. S. Phillips, honorary physicist to the hospital, on Wednesday, December 10, at 5 p.m.

As announced already, the Physical Society's annual exhibition is to be held on Tuesday, December 16, at the Imperial College of Science, South Kensington. In the afternoon, the Hon. R. J. Strutt, F.R.S., will give a discourse on spiral electric discharges, and in the evening Mr. Louis Brennan, C.B., will show some experiments with soap films. About thirty firms of scientific instrument-makers will be exhibiting, and there will also be certain experimental demonstrations.

THE gold medal of the Apothecaries Society was awarded on November 28 to Mr. J. E. Harting, in recognition of his services in preparing and editing the catalogue of the library in Apothecaries' Hall. The society was founded in 1617, and the library, which chiefly consists of medical and botanical works, contains a number of rare old "Herbals," including a copy of Johnson's edition of "Gerarde's Herbal," published in 1633, presented by the author.

THE Board of Trade has appointed a committee to consider the causes of explosions which have occurred in connection with the use of bitumen in laying electric cables, and to report as to any steps which should be taken to prevent explosions in future from the use of bitumen or similar substances. The members of the committee are:—Sir T. Edward Thorpe, C.B., F.R.S. (chairman); Mr. R. Nelson, of the Home Office; Mr. W. Slingo, of the General Post Office; Mr. J. Swinburne, F.R.S.; and Mr. A. P. Trotter, of the Board of Trade. Mr. M. J. Collins, of the Board of Trade, will act as secretary to the committee.

AN International Dairy Congress is to be held at Berne, Switzerland, in June next. It will be the sixth congress organised and held under the auspices of the Federation Internationale de Laiterie, a body having its head office in Brussels, and a committee composed of representatives of all the leading countries in the world. The secretary of the British Dairy Farmers' Association, Mr. F. E. Hardcastle, 12 Hanover Square, W., is acting as secretary to the British Section, and will give full information to any who may be interested. The sections under which papers will be read and subjects discussed are:—I., Hygienics; II., Chemistry and Bacteriology; III., Theory of Management; and IV., Trade.

THE death is announced, in his seventy-sixth year, of the Rev. J. A. Gilfillas, who, with Mr. W. W. Cooke, made important explorations between 1880 and 1890 around the head-waters of the Mississippi. They contributed largely toward fixing Elk Lake, instead of Lake Itaska, as the chief source of that river. Mr. Gilfillas was also an expert in ethnology and in the Indian languages.

AN interesting collection of photographs from Hungary, Germany, Sweden, and New Zealand is now on view at the house of the Royal Photographic Society, 35 Russell Square, W.C., and will be open to the public on presentation of visiting card, daily from 11 a.m. to 5 p.m., until December 20. The collection includes a remarkable series of twenty-seven marine studies taken by flashlight in the Biological Marine Aquarium of Heligoland, by Mr. F. Schensky. The great technical merit of these photographs of fishes, crustacea, sea anemones, molluscs, &c., will be obvious even to the superficial observer; it is very rarely that one has the opportunity of seeing such fine work of this class. The rest of the hundred or so photographs claim attention chiefly because of their pictorial merit.

The following are among the lecture arrangements at the Royal Institution, before Easter:—Prof. H. H. Turner, a course of experimentally illustrated lectures on a voyage in space, adapted to a juvenile auditory, to begin on December 27; Prof. W. Bateson, six lectures on animals and plants under domestication; Sir John H. Biles, three lectures on modern shipbuilding; Mr. A. H. Smith, two lectures on landscape and natural objects in classical art; Dr. W. McDougall, two lectures on the mind of savage man; Sir Thomas H. Holland, two lectures on types and causes of earth-crust folds; Prof. C. F. Jenkin, three lectures on heat and cold; Dr. C. W. Saleeby, two lectures on the progress of eugenics; Dr. J. A. Harker, two lectures on the electric emissivity of matter; and Sir J. J. Thomson, six lectures on recent discoveries in physical science. The Friday evening meetings will commence on January 23, when Sir James Dewar will deliver a discourse on the coming-of-age of the vacuum flask. Succeeding discourses will probably be given by Mr. H. Wickham Steed, Dr. H. S. Hele Shaw, Prof. J. Norman Collie, Prof. W. A. Bone, Sir Walter R. Lawrence, Bart., the Right Hon. Lord Rayleigh, Prof. J. A. Fleming, Sir J. J. Thomson, Prof. A. Keith, and other gentlemen.

With the ordinary issue of *The Times* on Monday, December 1, appeared a special Fuel Supplement of sixty pages, in which the various aspects of the whole subject of fuel are dealt with. The appearance of this supplement to our leading daily journal and the general trend of all the articles, is evidence that the immense importance of the future supplies of fuel must be brought home to the public. Many perhaps still fail to realise the rapid depletion of our resources which is taking place daily, and the necessity for economy in production and economy in application. The first step to economy is wider knowledge, and whether for the lay reader (if there is such a person in this connection), or for the fuel expert, the series of articles is admirably adapted to give a general and sufficiently detailed account of the whole question. The various forms of fuel are described from the economic point of view: their production, distribution, properties, and the best methods of utilisation detailed. Such minor issues as smoke prevention, safety in coal mines, the scientific purchase of coal, and other complementary subjects are dealt with adequately. Nor is the future overlooked, when man will have to manufacture his fuel from materials obtainable from existing natural sources; and the claims of alcohol, which up to the present is but a very minor fuel, are discussed at some length. People more particularly interested in fuel and its commercial application will most certainly welcome the appearance of the supplement, and for others who take an intelligent interest in a subject of such general and economical importance, it furnishes a comprehensive account of the whole question.

Mr. J. Reid Moir, of Ipswich, has forwarded a typed letter and printed notices asking for careful treatment of ancient remains, to all the brickfields and other places in Suffolk where continual excavations are in progress. By this means he hopes to hear of any interesting relics which may be found, and for want of knowledge be overlooked or thrown away as being of no value.

In a letter published in Nature of November 13, Prof. D. Waterston referred to some excellent radiograms of the Piltdown mandible, and that of a chimpanzee which appeared in an October issue of *The British Journal of Dental Science*. There was an article upon the radiograms in the same issue, but Prof. Waterston was concerned only with his interpretation of the radiograms themselves. Mr. A. S. Underwood, the author of the article, writes to say he considers it misleading to state "that the molar teeth in the fragment not only approach the ape form, but are in some respects identical. These two molar teeth are absolutely human, the difference between them and those of the anthropoids in the arrangement of the enamel alone being quite unmistakable." Any fresh evidence bearing upon the problem of the mandible is of importance, and it is to be hoped that Mr. Underwood will publish at an early date, with illustrations, the evidence he has obtained of "unmistakable" characters in the arrangement of the enamel.

According to the report for 1912, the authorities of the Rhodesia Museum, Bulawayo, are considering a scheme for the erection of a new west wing to the building, at an estimated cost of about 1400*l.* The curator reports that as much progress as could reasonably be expected, when the funds at his disposal are taken into consideration, has been made in the development of the museum during the year under review.

We have received No. 39 of Dr. Schulze's *Das Tierreich,* a fasciculus of 210 pages, devoted to that group of malacostracous crustaceans known as Cumacea or Sympoda. The author is the Rev. T. R. R. Stebbing, who has already contributed to this work the memoir on the gammarid amphipods (No. 21), and who, as in that fasciculus, writes in English. In deference to the usage in the rest of the work, Mr. Stebbing surrenders his favourite practice of treating all generic names as masculine, and on similar grounds he retains the older name Cumacea for the group in place of Sympoda. The objection to the use of the former is based on the cancelling of the generic term Cuma; but although this bars the employment of the family name Cumaidæ, it does not, in our opinion, entail the abolition of the ordinal designation. On the other hand, it is a pity that some objection could not have led to the abolition of such a name as "Vaunthompsoniidæ." The work is worthy of the high reputation of its author as a specialist in the group of animals with which it deals.

We have received a prospectus of an interesting publication to be issued by the naturalists of the Biological Station in Heligoland. The proposal is to issue a series of plates of instantaneous photographs illustrating the living marine animals and plants of the North Sea. The specimen proof that has been forwarded with the prospectus is an extremely beautiful photograph of the jelly-fish, *Cyanea lamarcki,* showing the numerous delicate tentacles in their natural position during life. Other photographs of the series were exhibited at the International Congress of Zoology at Monaco, and created much interest and admiration. Each plate will be accompanied by six pages of description, and the publication will be of quarto size. The price, 8 marks for each part of ten plates, is not excessive. The series will be published by Werner Klinkhardt, of Leipzig, with the title, "Tier- und Pflanzenleben der Nord See."

It is well known that the loss of life during earthquakes in Italy, which in some towns has amounted to more than half the population, is largely due to the faulty construction of the houses. Prof. Omori indeed estimates that 998 out of every thousand persons killed in Messina in 1908 were victims of such defects. The construction of new buildings in the seismic districts is governed by stringent regulations both as regards site and design. Dr. Agamennone, however, suggests in a recent paper (*Rivista di Astronomia,* September, 1913) that these regulations should be supplemented by periodic inspection, and, if necessary, strengthening, of all existing houses.

The Times for November 25 contains an article from its Panama correspondent on the recent earthquakes felt in the canal zone. The strongest shock of the series was that which occurred on October 1, but it seems to have caused little damage except at Los Santos, which is about a hunderd miles from the canal. The writer considers the effects of a fault-displacement through the Gatun dam or the locks at the ends of the canal, and shows without difficulty that the result in either case would be disastrous. It seems unnecessary, however, to take into account a contingency so remote. The danger, if danger there be, is more likely to arise from the secondary effects of a strong shock occurring within a comparatively short distance from the canal. So long as the epicentres remain in a region a hundred miles or more from the canal, the risk of such damage must be small.

Although the crest of the Appalachian chain has long been known to form a line of division between two more or less distinct fresh-water faunas on its opposite flanks, the fact that a similar condition, in a more pronounced degree, holds good in the case of the Alleghenies has been to a great extent overlooked. In order to fill this gap in our knowledge, Dr. A. E. Ortmann has undertaken an investigation of the faunas of the various streams, based chiefly on the fresh-water mussels or naiads, but also including certain other groups, such as crustaceans, the results of which are published in vol. lii., No. 210 (pp. 287–390), of the Proceedings of the American Philosophical Society. It is considered that the Allegheny system forms an ancient and well-marked boundary between the fresh-water fauna of the interior basin and that of the Atlantic slope. In the former area the fauna of the upper Ohio basin is characterised by its uniformity—a feature acquired in post-glacial times; but on the western side there are indications of a preglacial faunistic differentiation. On the other hand, the marked distinctness of the Atlantic fauna is held to justify the foundation of two faunistic provinces—Mississippian and Atlantic—despite the fact that the fauna of the latter is a derivative from that of the former area. The Atlantic fauna is divisible into a northern and a southern group; and a dispersal line directed both north and south is recognisable on the Atlantic slope. Finally, a few cases in the mountains point to a crossing of the divide; while on the Atlantic side there occur certain instances of abnormal distribution which demand special explanation.

The synoptic weather maps for November 7–13 included in the first issue of the Meteorological Office chart of the North Atlantic for December exhibit a very striking feature of the distribution of atmospheric pressure. The useful notes which accompany the maps explain that an extensive and deep cyclonic system lay almost stationary athwart the Transatlantic steamer routes, and remained there persistently for some days. There was a complete wind-circulation, but only few records of gales. Another deep disturbance lay over the American Lake region, and exceptionally violent gales were reported there. The abnormally mild type of weather over this country and western Europe was due to the ocean depression above referred to. The two disturbances were separated by a ridge of high pressure, extending across Newfoundland towards Davis Strait.

During the ice season of this year patrols in the North Atlantic were undertaken by the U.S. revenue cutters *Seneca* and *Miami,* and very interesting reports of the cruises of both vessels are contained in the Pilot Chart of that ocean for October, issued by the U.S. Hydrographic Office. The following notes are taken from the observations and deductions made by Capt. Johnston during the cruises of the former vessel. All the ice seen on or near the Grand Bank was of the Greenland type, in berg form. The largest berg seen was about 400 by 300 ft., the height above the water being 70 ft.; as to shape, no two bore any striking resemblance to each other. The only type not seen was the kind popularly pictured in school books, with overhanging, craggy pinnacles. The greatest distance at which ice was observed was eighteen miles, on a clear day. With the searchlight a berg could be seen about three miles on a dimly moonlight night, but owing to the blinding effect on the observer, its general use for a vessel under way is not recommended. A berg may or may not give an echo; about 90 per cent. of attempts made were without result, so that the absence of an echo proves nothing. Sudden changes of sea temperature mean nothing so far as bergs are concerned, and as a rule little or no change was found in the air temperature near a berg. In Capt. Johnston's opinion, the only safe way to navigate regions of icebergs is to stop during thick weather and to run very slowly on dark nights.

In the Proceedings of the Royal Society of Edinburgh for 1910 Mr. J. B. Ritchie showed that the amplitude of the nth torsional oscillation of a weight supported by a thin wire was inversely proportional to a power of $n+n_0$, where n_0 is a constant depending on the material of the wire. In the Proceedings for 1912–13 Prof. W. Peddie carries the investigation of the problem a step further by showing how the oscillations themselves are performed. To do this he provides the lower surface of the oscillating body with a number of pins, which make contact with mercury placed in slits in the top surface of an ebonite disc. The resulting currents operate the recorders of an electrical chronograph. He finds that the period of the motion towards, is distinctly greater than that away from, the equilibrium position, and that throughout the whole of the former and the first part of the latter path the motion is of the simple periodic type. Both these results, he shows, can be explained on the assumption that the motion when it exceeds a certain magnitude breaks up molecular groups in the suspending wire.

AN important paper on the phenomena occurring in solutions of radio-active products was read by Dr. T. Godlewski before the Academy of Sciences at Cracow on June 2, and also published in *Le Radium* for August last. In the experiments described a solution of radium emanation with its disintegration products in pure water was electrolysed. Radium A appeared at the anode and radium B at the kathode, while radium C was deposited in about equal quantities at both the anode and kathode. The nature of this deposition points strongly to the supposition that the products are present in the colloidal state and not as ions, the radium A forming negative, radium B positive, and radium C both negative and positive suspensions. This assumption was verified by experiments on the effect of adding small amounts of different electrolytes, such as HCl, NH_4OH, $Al_2(SO_4)_3$, and $K_3C_6H_5O_7$, which are known to affect the speed and direction of transportation of such suspensions. For instance, the H ions obtained by adding HCl in very small concentration (0·00003 normal) were shown to diminish the number of negative suspensions of radium A, and increase the number of positive suspensions of radium B. With further increase in concentration of HCl the radium A atoms begin to appear at the kathode. The action of basic ions was also shown to be very pronounced, and in the opposite direction to that of acids. The assumption that the products in neutral solution are present as colloids is also supported by recent experiments of Paneth, who has shown that polonium can be separated from lead by allowing the latter to diffuse through an animal membrane.

PARTS 1 and 2 of the Science Reports for 1913 of the University of Sendai, Japan, contain a series of papers by Prof. Honda and his pupils on the magnetic properties of ferro-, para-, and dia-magnetic substances and the effects of temperature upon them. For ferromagnetic substances the observations cover the effect of temperature on the intensity of magnetisation at various fields, the temperature at which magnetic changes occur and the heat developed or absorbed during the process. A magnetometric method was used. Soils were investigated by the torsion balance method, the specimen being placed in a magnetic field for which HdH/dx was known. The susceptibilities were found to decrease as the temperature rose and to reach a value nearly zero between 500° and 600° C. They decreased also with increasing magnetic fields. Many alloys of antimony, lead, aluminium, zinc, tellurium, tin, and bismuth were investigated by the same method to test the influence of composition on susceptibility. In no case does it appear possible to calculate the susceptibility of such alloys from those of their constituents, and in almost all cases the alloys having their constituents in simple atomic proportions display characteristic magnetic properties.

CIRCULAR No. 42 of the Bureau of Standards, Washington, deals with metallographic testing, and contains a concise account of the scope of the subject, thermal analysis, and microscopic analysis, followed by full directions for preparation and forwarding the samples. Circular No. 25 of the same bureau contains general information regarding standard analysed samples. Details are given of the precautions taken in manufacture to secure pure and homogeneous samples. Before the final bottling, samples for analysis are removed from the jars and sent, one each, to a number of analysts. In general three types of analysts are chosen—commercial chemists, works chemists, and chemists of the bureau. When all the analytical results have been received they are inspected, and, if not sufficiently concordant, analysts are sometimes requested to repeat the determinations without knowing the direction from the mean in which their value lies. The standard samples include various steels, zinc ore, iron ores, naphthalene and sugar for calorimetric standards, benzoic acid, for calorimetry and for alkalimetry, and sodium oxalate. The prices are moderate, averaging two dollars for quantities of 50 to 150 grams.

THE Transactions of the American Institute of Chemical Engineers (vol. v.) contains a paper by A. S. Cushman and H. C. Fuller, of the Institute of Industrial Research, Washington, upon a chemical investigation of Asiatic rice. So far as the results of analysis can be interpreted in the light of the information at hand, the authors conclude that there appears to be no reason why the white milled rices from one section of the world should be held more responsible for malnutrition than similar rices from other parts. In the same volume J. C. Olsen and A. E. Ratner contribute a paper upon the decomposition of linseed oil during drying. While oxygen is absorbed, water and carbon dioxide are given off, the effect upon the weight of the oil being shown. The opacity and hiding power of pigments forms the subject of investigation by Mr. G. W. Thompson. For the purposes of these experiments an apparatus was devised consisting of a photometer which brings two fields of light into juxtaposition, so that they can be compared by the eye. This photometer is placed on top of two tubes, the lower ends of which have lenses. Paint placed between one set of lenses can be compared with a standard paint or with pieces of paper which have been tested on a photometer bench. Mr. M. C. Whitaker contributes a paper on the chemical engineering course and laboratories at Columbia University. The course provides for post-graduate students who have taken a university degree. It has been observed that for several years more than 20 per cent. of the students of engineering at Columbia have possessed the college degree at entrance.

A COPY of Merck's annual report on recent advances in pharmaceutical chemistry and therapeutics has recently reached us. Lecithin is taken as the subject of the special monograph this year, and some seventy pages are devoted to it. In these are given an account of the chemistry and physiology of the lecithins, a discussion of the rôle which they are believed to play in the phenomena of metabolism and nutrition, and a summary of the results obtained with them in therapeutical experiments. A large amount of work has been done on these bodies, and students will find this account a convenient bird's-eye view of the subject. An extensive bibliography of lecithin literature is appended; both this and the description of the analytical tests will be found useful. Another special feature of the report is a supplement giving a detailed account of the methods used for the physiological standardisation of digitalis preparations in the Pharmacological Institute, Erlangen University. Gratusstrophanthin is used as the standard toxic substance for comparison, the subjects being frogs, mice, rabbits, and cats. Among the ordinary records may be mentioned as of special medical interest those on salvarsan and neo-salvarsan, chineonal, mesothorium, hypophysis preparations, and nucleinic acid; whilst the attention of analysts may be directed to those on cobalt-sodium nitrite, hydrazine sulphate, blood tests, uranium acetate in the determination of albumen, and the use of dimethyl-glyoxal as a reagent for nickel and ferrous iron.

IN his second lecture to the Institute of Chemistry on "The research chemist in the works, with special reference to the textile industry," Mr. W. P. Dreaper directed attention to the importance of a knowledge of theory, and illustrated this point by a reference to the work done in connection with the presence of stains and loss of strength experienced on the storage of certain silk goods. These faults were found to be due to the free sulphuric acid. Only a knowledge of theory could suggest why this acid could be present in cases where it had never been used in any process of manufacture. The so-called "neutral salt reaction" had offered a solution to this problem, and has relieved the dyer from constant blame. Continuing, he said the British aniline dye industry has recently made remarkable progress, and its products are even being sold in Germany. The future will see considerable expansion in this reviving industry.

IN an address recently delivered before the Calcutta Chemical Club Prof. P. C. Rây emphasises the extraordinary progress made by chemical research in Bengal during recent years; in the session 1912–13 alone more than sixty contributions were published from the chemical laboratory of Presidency College by Prof. Rây and his students. Owing to the recent munificent gifts of Sir T. Palit and Dr. Rashbehary Ghosh, it has become possible to found a University College of Science in Bengal, which it is hoped will bring about a renaissance of the scientific spirit in India. It is noteworthy that Dr. Ghosh has expressed the opinion that the higher academic degrees should be conferred only on those who have done original research work. He would abolish examinations for these degrees and make research work the only qualifying test, and Prof. Rây cites a case in which one of his recent students who was "plucked" in the B.Sc. examination, has since shown conspicuous ability in research, and is deserving of the highest degree.

The Engineering Magazine for November contains an illustrated article by W. Wilson, dealing with the development of Auckland Harbour, New Zealand. Nine years ago, when the present engineering staff took up their duties, a wooden wharfing scheme was in existence. Various timbers had been used in its construction, but every available wood was destroyed by an energetic species of Teredo. Even wood that is nearly impervious in Australian waters is attacked here. Ferro-concrete construction has been adopted, and after about seven years' trial has proved an entire success; while the prevailing mudstone on the shores of the harbour is riddled with molluscs, the concrete is quite proof against attack. The article has several photographs showing the condition of the old wooden piles; inspection of these illustrations indicates that the Auckland Harbour Teredo does its work in a most thorough fashion. Often only three years is required to honeycomb even the hardest timber.

THE seventh part of Dr. Koningsberger's *Java* is devoted to the faunas of open fallow lands and of fields which have been long under cultivation, the last chapter, dealing with the fauna of cacao plantations. On p. 311 the author speaks of the black-necked *Lepus nigricollis,* which haunts the fallows, as the Javan hare, whereas, according to Blanford, it is naturally restricted to southern India and Ceylon, whence it has apparently been introduced into Java.

WE have received from Washington a catalogue giving prices and carefully worded descriptions of the publications of the Carnegie Institution. Copies of each of the works, except the "Index Medicus," are sent gratuitously to a limited number of the greater libraries of the world, while the remainder of the edition is sold at a price sufficient only to cover the cost of publication and of transportation to purchasers. The catalogue concludes with an index of authors with condensed titles of their works. Copies of the catalogue may be obtained on application to the Carnegie Institution at Washington, D.C., U.S.A.

THE issue for 1914 of *The Scientists' Reference Book and Diary,* has been received from the publishers, Messrs. Jas. Woolley, Sons, and Co., Ltd., of Manchester. The reference book contains useful chemical and physical constants, glossaries of scientific and technical terms, and a miscellany of useful information. The diary is compact and conveniently arranged. The volumes are contained in a neat leather case of pocket size. The price of this popular diary is 2*s*.